
Successful first swap renal transplant in a public hospital

INTRODUCTION

We report the first swap kidney transplant at a public hospital in Maharashtra after the 2011 amendment in the Transplantation of Human Organs Act.^[1] According to this law, an unrelated donor could donate his or her kidney to a recipient whose family member would in return donate one kidney to another patient. This method is successful for that whose blood group does not match within the family and require kidney donation from a stranger. Awareness about swap kidney transplant is still less in India.^[2,3] As per the State Directorate of Health Services, participation by public hospitals in this type of transplant is negligible due to huge cost, lack of adequate operation theatres (OTs), etc.^[4]

Urosurgery, nephrology and anaesthesia departments were thoroughly prepared for successful peri-operative management of these two transplant surgeries. This was possible only because of coordinated teamwork of all these speciality doctors and respective staff members.

CASE REPORT

This live-unrelated transplant included two married couples. The patients were the husbands aged 53 and 52 years who were end-stage renal disease (ESRD) patients and both were on dialysis from 8 months to 1 year. Coincidentally, both were from the same place. They were waiting for matching donors for 6–8 months. Since their beds were close by and they were from the same native place, nephrology head discussed and decided about swap transplant. Their spouses were counselled for compatibility testing with opposite recipients.

Because of the wide range of information necessary to determine eligibility for transplant, the evaluation process was carried out by a transplant team. Investigations included blood grouping and human leucocyte antigen matching, complete blood count, liver function test and renal function test, serum electrolytes, coagulation profile and blood sugar levels. X-rays, pulmonary function testing, ultrasound and renal scan as well as echo cardiology were also done.

Pulmonary medicine, cardiology, gastroenterology and psychiatry evaluation and optimisation were done for recipient. Ophthalmology, ear-nose-throat, dental, dermatology, gynaecology (for donors, females) reference were obtained to rule out any infection.

The following steps preceded the transplant:

The complete transplant procedure, risks and benefits of the transplant surgery were explained to the patients and thereafter informed consents were taken from all the patients. Patients' overnight fasting was confirmed. Various mandatory forms were duly filled and signed, such as Form 1, 3, 4, 5, 18, 19 and 20.^[1,5]

The recipients received dialysis a day before surgery and immunosuppressants such as anti-thymocyte, globulin, mycophenolate and corticosteroids were started by nephrology to reduce the risk of rejection.^[6]

Both the pairs were taken to the OTs on the same day. Due to an unavailability of four OTs at a time, we induced one pair at a time and the second donor was induced before the extubation of first recipient and after proper fumigation, to avoid refusal of consent by the second donor. The monitoring included was non-invasive blood pressure, pulse oximetry, electrocardiogram and capnography for donors. In addition to this, central venous pressure (CVP) monitoring was done for the recipient. Anaesthesia plan was epidural analgesia and general anaesthesia with controlled ventilation for both donors. The goals in the intraoperative anaesthesia management of the donors were to maintain renal perfusion by ensuring euvolaemia, normotension, adequate urine output >2 ml/kg and adequate analgesia. The left kidney was preferred for both donations. During the procedure, once the renal arteries were clamped, warm and cold ischaemia times were recorded. The goal in intraoperative anaesthesia management of the recipients was to maintain renal perfusion by keeping mean arterial pressure >80 mm of Hg, care of arteriovenous fistula and to avoid

hypoxia, hypovolaemia, hypotension and nephrotoxic drugs.^[6]

Aseptic precautions were ensured throughout. All the vitals were kept stable throughout the procedure and CVP was maintained around 8–10 cm of water. After procuring the kidneys, they were thoroughly flushed with the preservative solution. The preservative solution used was iced Ringer lactate solution with hydrocortisone, sodium bicarbonate and heparin. The kidneys were then placed in the abdomen in respective pairs in pelvic floor; renal vessels were anastomosed with the external iliac vessels and ureters implanted to the urinary bladder. Human albumin 20% was infused before the completion of arterial anastomosis. Warm ischaemia time was 1 min 40 s and 1 min 10 s, and cold ischaemia time was 43 min and 54 min. The second kidney had three renal arteries, so it took more time for anastomosis.

Urine outputs were 3700 ml and 1700 ml after the anastomosis. After completion of surgery, all the patients were extubated. The recipients were shifted to the nephrology care unit. The donors were shifted to the urology ward and monitored there. Both donors were discharged on the 5th day. After 1 month, both recipients were discharged.

DISCUSSION

As per statistics, prevalence rate of chronic kidney disease ranges from 4% to 17.2% in India.^[7] Approximate incidence rate of ESRD is 151–232/million population.^[8] In India, 150,000 people wait for renal transplantation at any point of time. Deceased organ transplantation in India is still in infancy phase due to lack of awareness, level of affordability, inadequacy of funds and unclear, poor national policies.^[2] Live-related and live-unrelated donors form the alternative. India has approximately 180–200 kidney transplant centres. Most of them belong to private sectors. Government hospitals provide dialysis, transplantations and follow-up with low cost. In Mumbai, Zonal transplant committee helps to organise it with low cost. A total of 11,570 grafts were taken from the deceased donor while 5535 from living donor.^[2]

'Transplant commercialism' is defined as a policy or practice, in which an organ is treated as a commodity, including by being bought or sold or used for material gain.^[5,9] High demand of organs led to commodification in developing countries due to poor population with

weak regulations.^[10] Since deceased organ donation rate is less, awareness about swap or donor exchange is must to curb such commercialism.

This first swap transplant in our hospital achieved success because of teamwork. Team included patients and their relatives, nephrologists, urologists and anaesthesiologists; twenty personnel worked for 12 h for both transplants from 7 am to 7 pm.

Total estimate of cost is Rs. 1.5 lakh per transplant including lifelong post-operative immunosuppressant's costs in government set up while in private sector, the cost is approximately Rs.5 lakh per transplant. Private hospitals have their special administrative services to take care of all administrative things; however, in municipal hospitals; respective faculty and their residents have to perform all administrative and clinical issues related to transplants. Time management is imperative as anxious families often worry about consent being withdrawn at the last minute. The surgery approval took 6 months of preparation in terms of paperwork and multiple approvals from Directorate of Medical Education and Research (DMER) and state government. We have to modify our clinical practice as per the number of patients and the availability of local resources so that results are as good as described in the literature. The centres with greater load of patients in a particular area should identify such needs and should do the needful for better outcome.^[2,11]

Kute *et al.* published a study about feasibilities and outcomes of seventy kidney swap transplants. One-, 5- and 10-year patient survival were 94.6%, 81% and 81%, and graft survival were 96.4%, 90.2% and 90.2%. About 10% patients were lost due to infections. These findings are very significant, helping to promote and encourage swap transplants and transplant centres in public hospitals. Private hospitals and corporate hospitals are already actively participating in swap transplant.^[12] In a study, involving 42 donors, length of hospital stays of donors was within 4 days and 53% donors returned to work in 4 weeks.^[13]

Since 1998 till now, KEM hospital has conducted 670 live single kidney transplants and 22 cadaveric kidney transplants.^[4,6] As per apex swap transplant registry data, total forty swap transplants have been carried out successfully in Mumbai, and the current waiting list is of 249 patients.

CONCLUSION

The successful swap transplant in public hospital has given ray of hope to life in poor population of our country. Patients and their relatives should be motivated for organ donation after death and also for live-related and live-unrelated donation to bridge the gap between availability and demand of organs.

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Conflicts of interest

There are no conflicts of interest.

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REFERENCES

1. The Transplantation of Human Organ (amendment) bill 2011. Available from www.mohanfoundation.org/THO-amendment-bill-2011.pdf.
2. Singh NP, Kumar A. Kidney transplantation in India: Challenges and future recommendation. *MAMC J Med Sci* 2016;2:12-7.
3. Agarwal SK, Srivastava RK. Chronic kidney disease in India: Challenges and solutions. *Nephron Clin Pract* 2009;111:c197-203.
4. Barnagarwala T. 2015 'In a First, a Public Hospital in City Set to Attempt Swap Kidney Transplant.' *The Indian Express*. 23 April page 19.
5. Shroff S. Legal and ethical aspects of organ donation and transplantation. *Indian J Urol* 2009;25:348-55.
6. Baxi V, Jain A, Dasgupta D. Anaesthesia for renal transplantation: An update. *Indian J Anaesth* 2009;53:139-47.
7. Singh AK, Farag YM, Mittal BV, Subramanian KK, Reddy SR, Acharya VN, *et al.* Epidemiology and risk factors of chronic kidney disease in India-results from the SEEK (Screening and Early Evaluation of Kidney Disease) study. *BMC Nephrol* 2013;14:114.
8. Modi G, Jha V. Incidence of ESRD in India. *Kidney Int* 2011;79:573.
9. International Summit on Transplant Tourism and Organ Trafficking. The declaration of Istanbul on organ trafficking and transplant tourism. *Clin J Am Soc Nephrol* 2008;3:1227-31.
10. Steering Committee of the Istanbul Summit. Organ trafficking and transplant tourism and commercialism: The declaration of Istanbul. *Lancet* 2008;372:5-6.
11. Srivastava A. Renal transplantation: An update. *Indian J Urol*

2007;23:270-1.

12. Kute VB, Gumber MR, Patel HV, Shah PR, Vanikar AV, Modi PR, *et al.* Outcome of kidney paired donation transplantation to increase donor pool and to prevent commercial transplantation: A single-center experience from a developing country. *Int Urol Nephrol* 2013;45:1171-8.
13. Peters TG, Repper SM, Jones KW, Walker GW, Vincent M, Hunter RD. Living kidney donation: Recovery and return to activities of daily living. *Clin Transplant* 2000;14 (4 Pt 2):433-8.

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